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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,732	10/17/2003	Myung Seop Kim	K-0546	8331
34610	7590	11/03/2004	EXAMINER	
FLESHNER & KIM, LLP P.O. BOX 221200 CHANTILLY, VA 20153			LEURIG, SHARLENE L	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/686,732	Applicant(s) KIM ET AL.	
	Examiner Sharlene Leurig	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 6-20 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed on August 4, 2004 has been entered and acknowledged by the examiner.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 6-8, 11, 12, 14, 15 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Forrest et al. (US 2001/0000005 A1).

Regarding claims 1, 11 and 20, Forrest discloses an OEL device comprising a substrate (Figure 12E, element 50), a first electrode (52) on the substrate, an organic emitting layer (56) on the first electrode, a second electrode having a stack of at least one transparent thin film layer on the organic emitting layer, the transparent thin film layer of the second electrode including a first layer of a metal (60M) and a second layer of a transparent material (60I), wherein the first layer and the second layer are stacked alternately.

Regarding claims 2 and 12, the first electrode (52) is formed of a material selected from the group consisting of ITO, Al and Ag (paragraph 0076).

Regarding claims 6 and 14, the first layer may be formed of Ag and Mg and the second layer is ITO (paragraph 0076).

Regarding claims 7 and 15, the transparent thin film layer of the second electrode includes 1-100 layers in total.

Regarding claims 8 and 11, the OEL device further includes a protection film having at least one transparent thin film layer (96, 97) on the second electrode (paragraphs 0080, 0081, 0103 and 0104).

Regarding claim 18, the second electrode comprises two or more sets of the first layer and the second layer stacked alternately (60I and 60M).

Regarding claim 19, the second electrode comprises a plurality of alternate stacks of said at least one metal layer (60M) and said at least one transparent thin film layer (60I).

Regarding claim 20, the OEL device comprises a second electrode having a plurality of alternate stacks, wherein each alternate stack includes at least one metal layer (60M) and at least a transparent thin film layer (60I) on the organic emitting layer and a protection film on the second electrode having a stack of at least one transparent thin film layer (96, 97) (paragraphs 0080, 0081, 0103 and 0104).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 6-8, 11, 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) (of record) in view of Furugori et al. (US 2002/0180350 A1) (of record).

Graff discloses an organic electroluminescent device comprising a substrate (Figure 1, element 105), a first electrode (200) on the substrate, an organic emitting layer (210) on the first electrode, and a second electrode (220) formed on the organic emitting layer.

Regarding claims 1 and 2, Graff fails to exemplify the material forming the electrodes.

Regarding claims 6, 7, 11, 14 and 15, Furugori teaches a second electrode having a two-layer structure comprising a first layer of metal such as Al:Li with a second transparent layer of ITO formed thereon, where the first and second layers are alternately formed and are therefore stacked alternately (page 4, paragraph 0063).

Regarding claims 2 and 12, Furugori teaches an OLED having a first electrode formed of a material selected from the group consisting of ITO, Al and Ag for transparency (paragraph 0079).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have first and second electrodes formed of transparent materials such as ITO and Al:Li, as taught by Furugori, in order to allow the light to be emitted from both sides of the device.

Regarding claims 8 and 11, Graff discloses a protection layer (130) on the second electrode.

6. Claims 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) (of record) in view of Furugori et al. (US 2002/0180350 A1) (of record) and further in view of applicant's admission of the prior art.

Graff discloses an OEL device having the structure of claim 1, and being transparent to light from either side, and further including hole and electron transport layers (230 and 235) forming the organic light emitting layer (210).

Graff fails to disclose the materials of the electrodes.

Furugori teaches an OEL device capable of transmitting light from both sides having a second electrode made of a first metal layer and a second transparent layer alternately stacked.

Neither Graff nor Furugori explicitly disclose separate hole injecting, electron injecting and emissive layers.

The applicant's admission of the prior art teaches an OLED having a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer formed on the first electrode in succession.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have a second electrode formed of a first metal layer and a second transparent material in order to form a transparent electrode, as taught by Furugori, and to further modify the OLED of Graff to have a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer in order to improve the performance of the device by providing specialized layers, as the applicant's admission of the prior art has taught those layers to be well known.

7. Claims 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) (of record) in view of Furugori et al. (US 2002/0180350 A1) (of record) and further in view of Kubota et al. (US 2002/0113241 A1) (of record).

Graff discloses an OEL device having a protection film formed over the second electrode, including three layers in a polymer-nitride barrier-polymer sequence in order to protect the device from degradation due to moisture and oxygen.

Graff fails to disclose the materials of the electrodes.

Furugori teaches an OEL device capable of transmitting light from both sides having a second electrode made of a first metal layer and a second transparent layer alternately stacked.

Graff fails to exemplify a protection layer having four layers in total.

Kubota teaches a light emitting device having a final protective layer encapsulating the entire device, where the final layer is formed of a fluoride containing polymer, which has very high water vapor barrier properties (paragraph 0096).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have a second electrode formed of a first metal layer and a second transparent material layer, as taught by Furugori, in order to allow the light to be emitted from both sides of the device and to further modify the OLED of Graff to have a final and fourth layer of the protection layer formed of a fluoride polymer, as Kubota has taught that such a layer has very high moisture barrier properties, in order to further protect the device from elemental degradation.

8. Claims 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) (of record) in view of Furugori et al. (US 2002/0180350 A1) (of record) and further in view of Kubota et al. (US 2002/0113241 A1) (of record) as applied to claim 9 above, and further in view of Uchida et al. (5,912,061) (of record).

Graff discloses an OLED having a protection film formed over the second electrode, including three layers in an acrylate polymer-silicon nitride barrier-acrylate polymer sequence in order to protect the device from degradation due to moisture and oxygen (column 2, lines 28-34; column 2, lines 9-17). Graff discloses that the two polymer layers can be formed of different materials (column 2, lines 33-35).

Graff fails to disclose the materials of the electrodes.

Furugori teaches an OEL device capable of transmitting light from both sides having a second electrode made of a first metal layer and a second transparent layer alternately stacked.

Graff fails to exemplify a protection layer having a layer of a fluoride polymer.

Kubota teaches a light emitting device having a final protective layer encapsulating the entire device, where the final layer is formed of a fluoride containing polymer, which has very high water vapor barrier properties (paragraph 0096).

Graff further fails to exemplify the types of acrylate polymers that can be used for the polymer layers.

Uchida teaches acrylate polymers used as protective coatings including a silicon compound of an acryl group, silicon acrylate (column 9, line 34) and many other types of acrylate, including stearyl acrylate (column 9, line 53).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have a second electrode formed of a first metal layer and a second transparent material layer, as taught by Furugori, in order to allow the light to be emitted from both sides of the device, and to further to modify the OLED of Graff to have a final and fourth layer of the protection layer formed of a fluoride polymer, as Kubota has taught that such a layer has very high moisture barrier properties, in order to further protect the device from elemental degradation, and to use stearyl acrylate for the first polymer layer over the second electrode and silicon acrylate for the third polymer layer, as Uchida has taught these acrylates as having good protective qualities.

Response to Arguments

9. Applicant's arguments filed August 4, 2004 have been fully considered but they are not persuasive.

The applicant's argument that the combination of the Graff and Furugori references is improper is not persuasive. The applicant has argued that there is no motivation to modify the OEL device of Graff to have a dual-layered second electrode of Al:Li and ITO, as taught by Furugori, because the references are directed to divergent inventive purposes. Namely, the applicant has argued that the Graff reference is concerned with barrier stacks encapsulating the OLED, while the Furugori reference is directed to an EL device having a superior antireflection effect (page 13).

The examiner disagrees that there is no motivation to combine the two references. Graff discloses an OLED having a transparent second electrode, but fails to exemplify the materials that may be used to provide transparency. Furugori teaches a transparent electrode comprised of a stack of Al:Li and ITO. Therefore there is motivation to combine the references in order to find a teaching of materials that may be used to form a transparent electrode. The rejection is maintained.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (571) 272-2455. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sll



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